WHAT IS CLAIMED IS:

1. An autostereoscopic optical apparatus for viewing a stereoscopic virtual image comprising an array of image pixels, said stereoscopic virtual image comprising a left image to be viewed by an observer at a left viewing pupil and a right image to be viewed by the observer at a right viewing pupil, the apparatus comprising:

(a) an image generation system for forming a left two-dimensional intermediate image and for forming a right two-dimensional intermediate image, said image generation system comprising:

(a1) a linear image modulator for modulating an incident light beam from a light source to form a modulated light beam;

(a2) a first beamsplitter for splitting said modulated light beam into a left image beam and a right image beam, said left image beam directed to a left diffusive surface for forming a left line of source pixels and said right image beam directed to a right diffusive surface for forming a right line of source pixels;

(a3) a left scanning ball lens assembly for projecting said left line of source pixels to form a left intermediate line image and a right scanning ball lens assembly for projecting said right line of source pixels to form a right intermediate line image, each scanning ball lens assembly comprising:

(a3a) at least one reflective surface for reflecting light from said left or right line of source pixels to said left or right intermediate line image, respectively;

(a3b) a ball lens segment having a scanning ball lens pupil, said ball lens segment having a center of curvature on said at least one reflective surface;

each said left and right scanning ball lens assembly rotating about an axis and forming a series of adjacent said intermediate line images in

order to sequentially form said left and right two-dimensional intermediate image thereby;

(b) a curved mirror having a center of curvature placed substantially optically midway between said left scanning ball lens assembly and said right scanning ball lens assembly;

(c) a second beamsplitter disposed to form said left two-dimensional intermediate image near a front focal surface of said curved mirror and to form said right two-dimensional intermediate image near said front focal surface of said curved mirror; and

said curved mirror forming said virtual stereoscopic image of said left and right two-dimensional intermediate images and, through said second beamsplitter, forming a real image of said left scanning ball lens pupil at said left viewing pupil and a real image of said right scanning ball lens pupil at said right viewing pupil.

2. An autostereoscopic optical apparatus according to claim 1 wherein said linear image modulator comprises an optical fiber.

3. An autostereoscopic optical apparatus according to claim 1 wherein said linear image modulator comprises an LED array.

4. An autostereoscopic optical apparatus according to claim 1 wherein said linear image modulator comprises a scanned light source.

5. An autostereoscopic optical apparatus according to claim 1 wherein said linear image modulator comprises a laser.